

Gastric Stump Carcinoma After Partial Gastrectomy for Benign Gastric Lesion: What Is Feasible as Standard Surgical Treatment?

YASUHIRO KODERA, MD, YOSHITAKA YAMAMURA, MD, AKIHITO TORII, MD,
KATSUHIKO UESAKA, MD, TAKASHI HIRAI, MD, KENZO YASUI, MD,
TAKESHI MORIMOTO, MD, TOMOYUKI KATO, MD, AND TSUYOSHI KITO, MD

From the Department of Gastroenterological Surgery, Aichi Cancer Center, Nagoya, Japan

Method: Clinicopathological features and prognostic factors were evaluated in 26 cases of stump carcinoma, operated on in the recent 20 years, in search of the standard surgical treatment.

Background: Stump carcinoma usually emerges more than 20 years after the initial gastrectomy and is often not diagnosed in the early clinical stage, resulting in a significantly low incidence of curative resection compared with primary gastric carcinoma.

Results: No improvement in the survival curves for stump carcinoma was observed between the past two decades. Nodal metastases were frequently found within the first tier nodes, and no 5-year survivor was found among the patients with nodal metastasis beyond pN1.

Conclusions: Subtotal gastrectomy might suffice for the treatment of stomal cancer, and most patients might not benefit from extensive lymphadenectomy. © 1996 Wiley-Liss, Inc.

KEY WORDS: gastric stump carcinoma, lymph node metastasis, lymphadenectomy

INTRODUCTION

Gastric carcinoma occurring 5 or more years after gastric surgery for benign disease is widely referred to as stump carcinoma [1]. Although surgery for benign gastric disease is performed less frequently since the advent of histamine H₂ receptor antagonists [2], the incidence of stump carcinoma is not likely to decline for several more years to come, because the risk of stump carcinoma is reported to increase from the fifteenth year following previous gastrectomy for benign lesions [3]. The prognosis of stump carcinoma has been considered poor [4], due in part to difficulties in early diagnosis. Even in a leading Japanese institution where the mass-screening system for early detection of gastric carcinoma has been established with success, stage IV cancer is reported to be predominant among patients with stump carcinoma [5]. However, the introduction of endoscopic screening as well as education and general understanding of the etiology of stump carcinoma [5,6] has led to the diagnosis of an increasing number of early stump carcinomas [1].

With the high incidence of gastric carcinoma in Japan,

remnant cancer following partial gastrectomy for gastric carcinoma is not uncommon and is found in just under 2% of all patients undergoing gastrectomy in our institution [7]. In these cases, lymphadenectomy performed in the preceding gastrectomy leaves little more lymphadenectomy to be performed in the resection of the gastric remnant. However, radical lymph node dissection is possible, and even recommended [5] in cases of stump carcinoma after gastrectomy for benign lesions. Although the significance of extensive lymphadenectomy performed in Japanese-type radical gastrectomy has been a matter of controversy, some good treatment results reported in Japan [8] have prompted several groups in Europe to perform radical lymphadenectomy [9] or to take part in randomized trials between Japanese and Western style gastrectomies [10]. However, little information has been

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Address reprint requests to Dr. Y. Kodera, Department of Gastroenterological Surgery, Aichi Cancer Center, 1-1, Kanokoden, Chikusa-ku, Nagoya, Aichi 464, Japan.

reported on nodal spread of the disease in stump carcinoma [5,11,12]. The purpose of this article is to identify the clinical and pathological characteristics and prognosis of stump carcinoma, and to evaluate the feasibility of extended lymphadenectomy in the treatment of stump carcinoma.

MATERIALS AND METHODS

During the 20-year period from 1974–1993, 26 patients with stump carcinoma were resected at Aichi Cancer Center Hospital, Japan. The previous gastrectomies for all 26 patients had been performed in other hospitals. All patients had undergone distal gastrectomy, with Billroth I reconstruction in 11 patients and Billroth II reconstruction in 15. The reasons for previous gastrectomies were gastric ulcer in 18, duodenal ulcer in 6, and benign tumor in 2 patients. In 5 patients the stump carcinoma was diagnosed either by a screening program or a personal annual check in the absence of symptoms. The operations performed for stump carcinoma were total gastrectomies in 17 patients and subtotal gastrectomies in 9. Ten of the 26 resections were palliative (peritoneal dissemination in 5, invasion to the surrounding viscerae in 4, and extensive para-aortic lymph node metastasis in 1) and 16 resections with curative intent. In 20 patients, lymphadenectomies were performed with subsequent data on nodal metastasis. Clinical stages and pathological findings of all resected specimens were classified according to the Japanese Classification of Gastric Carcinoma [13]. These data were analyzed by means of survival curves to assess the prognostic factors in stump carcinoma, although the number of patients was too small to obtain valid results with the multivariate analysis. All patients were followed for at least 2 years, or until death. The Kaplan–Meier method was used to plot the survival curves and Logrank test to evaluate the difference between the curves. Two hospital deaths were omitted from the analyses utilizing the survival curves. The Chi-square test was performed for the univariate analyses.

RESULTS

Clinicopathological Features of Stump Carcinoma

The mean age of the patients was 58.8 years and the male-to-female ratio was 2.9:1. The time interval between the first gastrectomy and diagnosis of the stump carcinoma was 20.7 ± 7.4 (mean \pm SD) years. Eighty-one percent (21 of 26) of the patients presented with gastrointestinal symptoms, the most prominent of which was epigastralgia (Table I).

Although early cancer invading no deeper than the submucosa was found in 42% (1,513 patients out of 3,576) of all gastric carcinoma cases operated on at Aichi Cancer Center during the same period, only 19% of the stump carcinomas (5 patients of 26) were early cancers, indicating the difficulties associated with early diagnosis

TABLE I. Symptoms of Patients With Stump Carcinoma

Symptoms	Cases	
	n	%
Epigastralgia	8	31
Appetite loss	5	19
Dysphagia	2	8
Nausea	2	8
Tarry stool	2	8
Anemia	2	8
No symptoms	5	19

of these cancers ($P < 0.05$). Gastrectomy with curative intent was performed only in 62% of stump carcinomas (16 of 26) as opposed to 84% of all gastric carcinoma patients ($P < 0.005$).

Serosal invasion (UICC pT3 and pT4) was observed in 62% of patients with stump carcinoma (16 cases out of 26) and nodal metastasis pathologically confirmed in 64% (14 out of 22 cases evaluated). Histopathologically, 46% of stump carcinoma (12 cases of 26) were classified as differentiated types. Of the 15 cases reconstructed by the Billroth II procedure, 11 lesions were found at the cephalad margin of the gastroenteric stoma as opposed to 1 of 11 cases reconstructed by the Billroth I procedure ($P < 0.01$).

Operative Procedures, Morbidity, and Mortality

Among the 26 patients, there were three cases of anastomotic leakage and a case of anastomotic bleeding. There were two hospital deaths due to cardiac failure in one patient and abdominal abscess following anastomotic leakage in another, for a mortality rate of 7.7%. No operative death was observed after 1987. Total gastrectomy was performed in 17 patients, 12 of which were curatively resected, and subtotal gastrectomy was done in 9 patients, 4 of which were with curative intent (Table II). Of these 4 patients, one is disease free for 2 years and another was alive for more than 10 years until death from an unknown cause, while the other two are the patients who died of postoperative complications as stated above. No statistical difference, on the other hand, was observed between survival curves for the 5 patients who underwent total gastrectomy as a palliative procedure and the 5 who underwent subtotal gastrectomy as a palliative procedure. Therefore, total gastrectomy is not necessarily the only standard procedure available for the treatment of stump carcinoma, especially when the lesion is found near the gastroenteric stoma.

Prognosis of Stump Carcinoma

The five-year survival rate of all 26 patients was 41%, and that of curatively resected cases ($n = 16$) was 72%. No patient who underwent palliative resection survived more than 2 years.

TABLE II. Patients Undergoing Subtotal Gastrectomy for Stump Cancer*

Location	Depth	Nodal status	Distant metastasis	Stage	Curability	Outcome
Stoma	sc	n2	Peritoneal	IVb	Palliative	Died after 645 days
C, post	se	n1	None	IIIa	Curative	Postoperative death (cardiac failure)
Stoma	si	n4	Para-aortic lymph nodes	IVb	Palliative	Died after 137 days
Stoma	se	n4	Para-aortic lymph nodes	IVb	Palliative	Died after 341 days
Stoma	sm	n0	None	Ia	Curative	Disease free for 2 years
C, post	ss	n4	Para-aortic lymph nodes	IVb	Palliative	Died after 430 days
Stoma	si	?	None		Palliative	Died after 646 days
Stoma	mp	n0	None	Ib	Curative	Died after 10 years
Stoma	mp	n2	None	IIIa	Curative	Postoperative death (anastomotic leakage)

*Depth, nodal status, and stages are classified according to the Japanese Classification of Gastric Cancer.
C, post, cardia posterior wall.

Significant differences in survival curves were revealed between cancer with ($n = 16$) and without ($n = 8$) serosal invasion ($P < 0.0005$), with ($n = 12$) and without ($n = 8$) nodal metastasis ($P < 0.01$), and with diameters greater than ($n = 11$) or smaller than 5 cm ($n = 13$, $P < 0.01$) (Fig. 1). Survival of the patients also correlated significantly with the clinical stage of the disease according to the Japanese Classification ($P < 0.005$). Serosal invasion, the most prominent prognostic factor in a group of remnant cancer that includes those following gastrectomies for malignant lesions [14], also seemed to influence the prognosis of stump carcinoma most prominently, and all patients without serosal invasion in the current study are alive following the operation. On the other hand, 9 of 13 patients who died of stump carcinoma had evidence of peritoneal dissemination, a direct consequence of serosal invasion. Other types of recurrences were hepatic in 3 and unknown in 1.

When the past two decades are split into two periods, 1974–1983 and 1984–1993, the survival curves for stump carcinoma patients operated on within each period were almost identical and no improvement in the treatment result of stump carcinoma was evident.

Incidence of Nodal Metastasis

Nodal metastasis was pathologically confirmed in 12 of 17 (71%) advanced cancers invading as far as or beyond the muscularis propria, while it was not detected in any of the 5 patients with early cancer. Evaluation was not possible in the remaining 4 patients with advanced cancer who underwent palliative resection without nodal dissection. Metastasis was most frequently found in No. 3 lymph nodes (along the minor curvature), followed by No. 4 (major curvature), No. 1 (right cardia), No. 7 (left gastric artery), and No. 11 (splenic artery), the incidence of which were 44%, 40%, 32%, 25%, and 25% respectively (Table III). Five-year survivors among those with nodal metastasis were 3 of 6 for No. 1 nodes, 1 of 6 for No. 4 nodes, and 1 of 8 for No. 3 nodes. There were no

survivors among those with nodal metastasis as far as or beyond n2 nodes (see Table III).

DISCUSSION

The incidence of stump carcinoma is reported to be quite high in Northern Europe [15], in fact, even higher than it is in Japan [16]. A comparison between patients with primary gastric carcinoma of the upper third of the stomach and stump carcinoma showed significantly better survival for the latter, provided the patients were confined to stages I and II [17]. No significant differences in survival were reported from other authors, among the curatively resected cases [18–20]. It is apparent from the current study and a previous report [5], though, that the proportion of stump carcinoma undergoing curative resection in Japan is significantly lower than that of patients with primary cancer. The reason for this is attributable to the delay in the diagnosis of stump carcinoma. Radiological examination, frequently performed for screening purposes in Japan, is not suited for detecting early lesions in gastric remnants [1], and rigorous screening of patients with previous gastric surgery by means of endoscopy [21] has not become popular in general. Several of the remnant cancers, occurring after radical gastrectomy for gastric malignancy are reported to be diagnosed within 10 years of the previous gastrectomy [12,14], not only as a metachronous multiple lesions [12] but also as a result of over-looking minute synchronous multiple lesions [7]. In these cases, follow-up studies with endoscopy are incorporated as an essential part of a personal annual follow-up program; the consequences of such efforts are reflected in the recent improvement in survival of patients with remnant cancer, attributable largely to the increase in early detection [14]. Such an annual follow-up program extending for several decades is not commonly performed after gastrectomy for benign condition. Consequently, 80% of the patients in the current study visited us for the first time with some gastrointestinal symptoms, and no im-

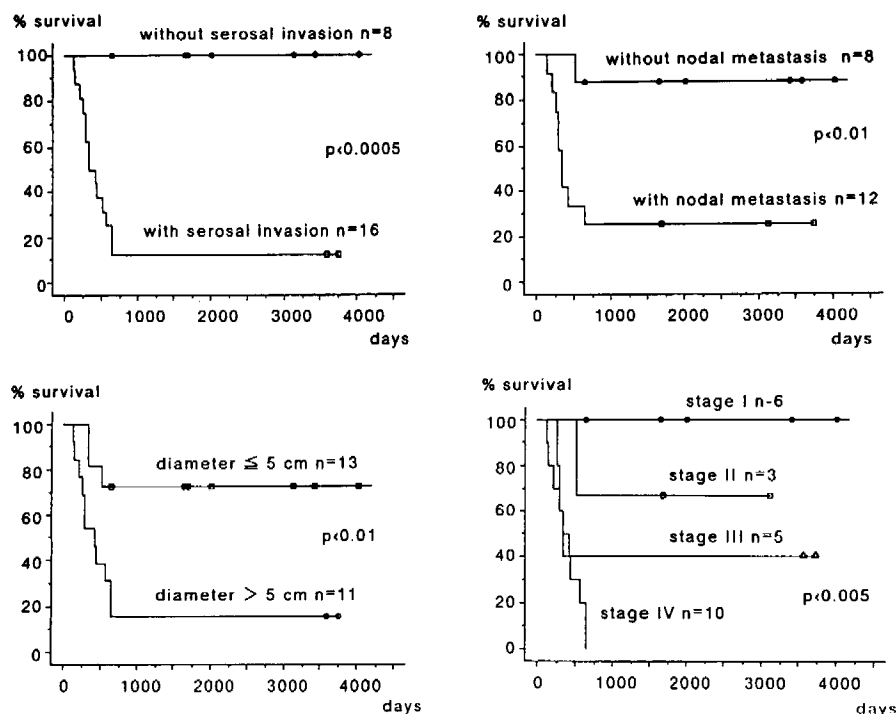


Fig. 1. Survival curves for the resected cases of stump carcinoma. Significant differences were observed by the log-rank test between patients positive and negative for serosal invasion ($P < 0.0005$), positive and negative for nodal metastasis ($P < 0.01$), and with cancer with the diameter of >5 cm and below 5 cm ($P < 0.01$). Survival of the patients also correlated significantly with the clinical stage ($P < 0.005$), according to the Japanese Classification of Gastric Cancer.

TABLE III. Location and Incidence of Nodal Metastasis and Therapeutic Value of Lymphadenectomy in Stump Carcinoma

Lymph node station ^a	Incidence of metastasis (%)	5-year survival rate of node-positive patients (%)
1 Right cardia	32	50
2 Left cardia	15	0
3 Lesser curvature	44	13
4 Greater curvature	40	17
7 Left gastric artery	25	0
8 Common hepatic artery	8	0
9 Celiac artery	13	0
10 Splenic hilus	8	0
11 Splenic artery	25	0

Lymph node stations are classified according to the Japanese Classification of Gastric Carcinoma. Numbers 1–4 belong to the first tier and numbers 7–11 belong to the second tier of lymph nodes, metastasis to the former being classified as n1 and the latter as n2; n1 and n2 are almost equivalent to pN1 and pN2 in the UICC TNM Classification.

provement in the survival curve of stump carcinoma was observed over the last two decades.

The need for such prophylactic monitoring is considered unrewarding by Fischer et al. [22], who claim that patients subjected to gastrectomy for duodenal ulcer have only a slightly higher risk of gastric carcinoma than that

of the general population within the first decade after operation. However, the current study indicates that the mean duration between the previous gastrectomy and diagnosis of stump carcinoma is more than two decades, and this agrees with the fact that the ulcer patients who had had gastric surgery between 1940 and 1960 showed

a 4.5-fold increase over the general population in risk of death from gastric carcinoma after 20 or more years from the previous surgery [23]. The lengthy process needed for the development of cancer through chronic stimulation by bile reflux or the reflux of duodenal content [24–26] might be an explanation for such long intervals observed before the emergence of stump carcinoma. Although the Billroth II operation was reported in the past to be significantly more often followed by gastric stump carcinoma than Billroth I reconstruction [23,27], stump carcinoma following Billroth I reconstruction has increased prominently [1], supportive of the thesis that there is no difference in the etiopathology of carcinogenesis in the Billroth I as compared with the Billroth II remnant. Stump carcinomas in the current study are almost equally preceded by Billroth I and Billroth II reconstructions. It is noteworthy, however, that stump carcinoma at the cephalad margin of the stoma, the type considered to be associated with bile or duodenal reflux, was found predominantly among those undergoing Billroth II procedures.

Analyses of the incidence of nodal metastasis in various lymph node stations have been reported exclusively from the Japanese investigators [5,11,12]. Our results agree with the past three reports that nodal metastases are more commonly found within the first tier nodes, followed by nodes along the splenic artery (No. 11 by the Japanese Classification). The incidence of metastasis in each station seemed to be a little higher in our study and the report by Furukawa et al. [12], compared with those reported by the other two investigators [5,11]. The importance of lymphadenectomy in cases of stump carcinoma has been postulated enthusiastically by Sasako et al. [5], who reported a 20% 5-year survival rate even in UICC pN2 patients. However, although there are no discrepancies in the 5-year survival rate of either all the resected cases or the curatively resected cases in their series and ours, we have so far come across no pN2 patient who has survived 5 years. In this study, as many as 71% of patients with stump cancer invading as far as, or beyond, the muscularis propria had pathologically confirmed nodal metastasis. However, although 12 D2 lymphadenectomies and 9 D1 lymphadenectomies were performed, only 3 of 14 patients with histologically proved nodal metastasis benefited from lymphadenectomy and are alive to date. All 3 patients were pN1 (the depth of one of the lesions was se, or pT3, while that of 2 other patients was mp (or pT2).

Radical procedures for lymph node resection will have little meaning, apart from providing more details for the clinical staging classifications, unless survival can be expected from the patients with lymphatic spread to the regions to be dissected; hence the therapeutic value of node dissection in each lymph node station can be estimated by multiplication of incidence of metastasis and percentage 5-year survival rate of patients with metastasis

for each station [28]. From such point of view, we are inclined to conclude that the patients with advanced stump carcinoma with lymphatic spread as far as the second tier nodes might not benefit from radical lymphadenectomy. At the same time, subtotal gastrectomy is considered feasible when resecting cancer located near the gastroenteric stoma, as long as sufficient cephalad and caudal margins can be obtained. It can also be an alternative when the operation has become palliative for reasons other than that of tumor margins.

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